

1999

Clark County

Mosquito Surveillance
and Monitoring Report

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Introduction

This was the second year a contract between the Clark County Mosquito Control District and Multnomah County Vector Control has been in place. This agreement provided Clark County with laboratory support for their mosquito control efforts. Clark County's goal through this contract was to determine the species of mosquitoes present and to continue a surveillance program to monitor for the presence of encephalitis within *Culex tarsalis* populations. The following report contains an explanation of the program, the results of the monitoring program, and an evaluation of the areas under surveillance.

The surveillance program was joint effort between the two counties with the goal of identifying mosquitoes to species at all life stages. In order to establish the program Clark County provided six Encephalitis Virus Surveillance (EVS) traps for monitoring adult populations. Multnomah County provided the personnel to monitor and maintain traps, and identify the samples collected. All of the samples collected were taken to the Multnomah County Vector Control office for processing. This season it was decided to forgo using Standard New Jersey Light Traps

CO2 Baited Trapping in Clark County

The traps used to monitor adult mosquitoes in Clark County this year were the Encephalitis Virus Surveillance (EVS) trap. The EVS traps utilize CO₂, produced by dry ice, as a mosquito attractant. This type of trap produces a clean sample and limits the time spent processing. EVS traps are set in the late afternoon or early evening in an area of dense adult harborage and protection from wind and theft. The traps are baited with five pounds of dry ice so that a continuous stream of CO₂ is released throughout the night. The traps are retrieved the following morning and the samples are brought to the lab for processing.

The use of EVS traps serves several purposes in adult mosquito monitoring. First, these traps are transportable. They can be set in areas that generate the high numbers of complaints and moved from one night to the next. Determining the species can help narrow down the search for the ovipositioning site. EVS traps can be set in areas with new water sources to determine if mosquitoes of a nuisance or health concern are being produced. Lastly, carbon dioxide baited traps are very efficient at trapping large numbers of *Culex tarsalis*. The traps sample the large numbers of live mosquitoes necessary to determine viral activity.

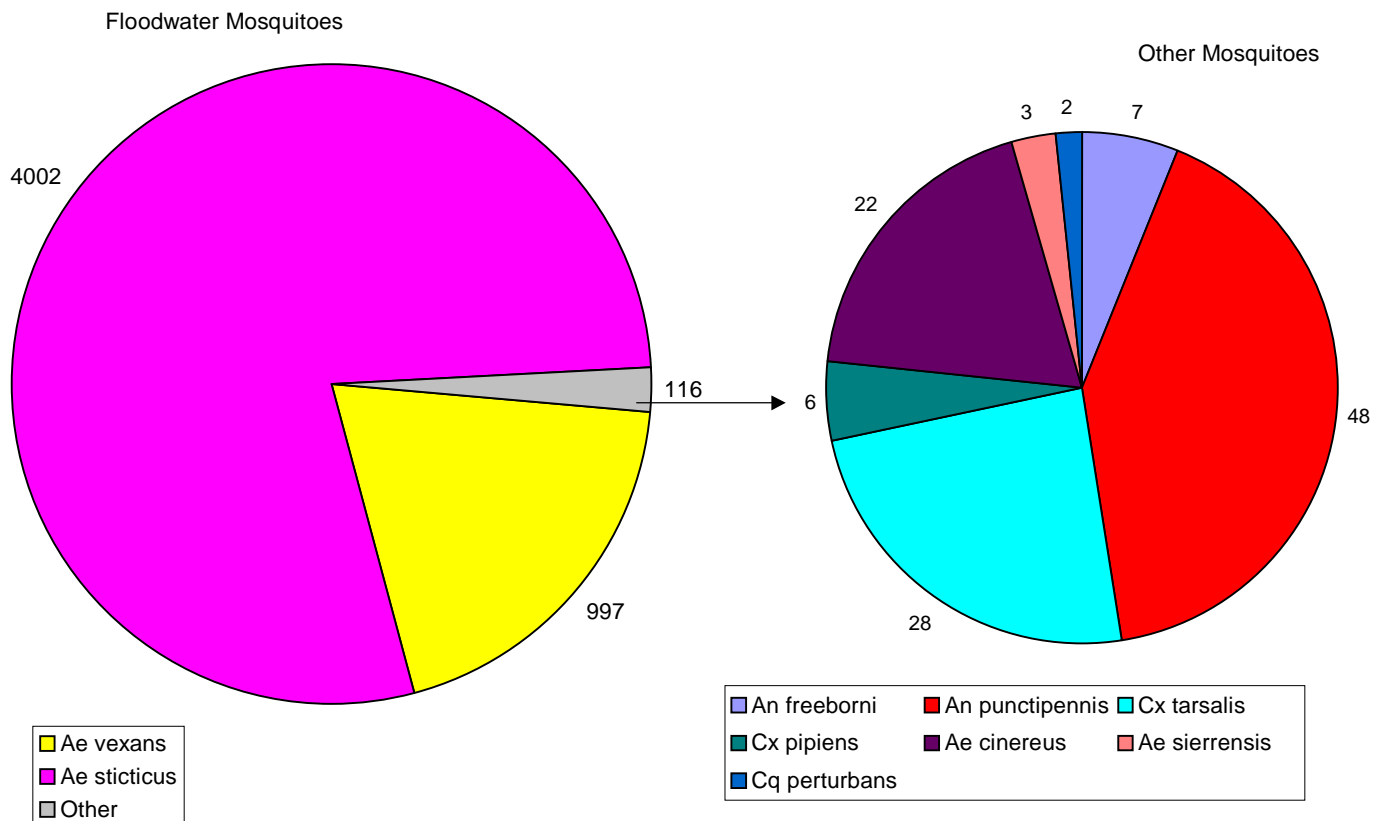
A total of 33 traps were set out in Clark County this past 1999 season. The areas trapped centered on Ridgefield, the Vancouver Lake and Salmon Creek areas of Vancouver, and the

Camas Washougal area. Much like last season the dominant species countywide was *Ae sticticus*, followed by *Ae vexans*, *Cx tarsalis*, *An punctipennis* and *Cx pipiens*.

Ridgefield Trapping Results

The dominant species EVS trapped on the Ridgefield refuge this year was *Aedes sticticus* (74%), followed by *Ae vexans* (19%). These mosquitoes were present in June and peaked in early July. In September the *Ae sticticus* were no longer being trapped though a few of the *Ae vexans* were still present. The average number of mosquitoes collected per trap increased from 141.5 last season to 393 per trap this season. Both of the flood water species mention showed drastic increases from last season and will probably show similar increases in the coming season. A total of 13 traps were set in and around the refuge over the 1999 mosquito season.

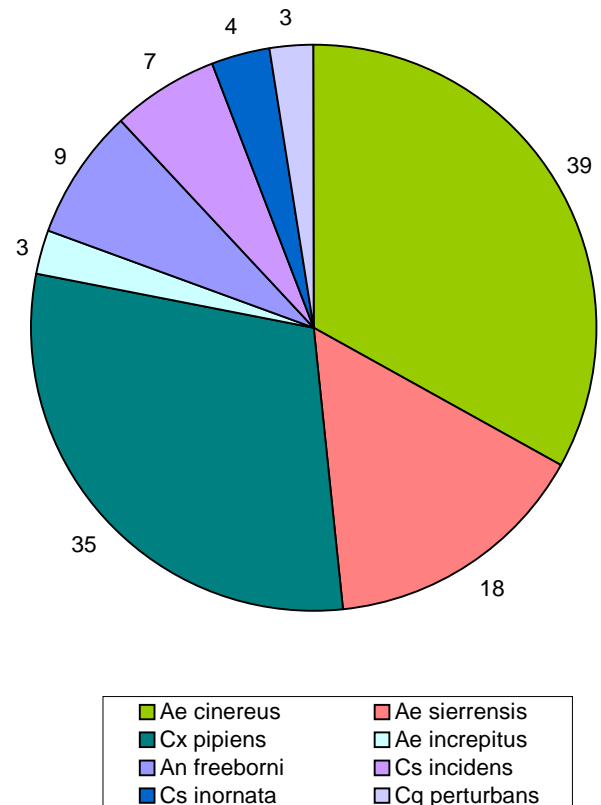
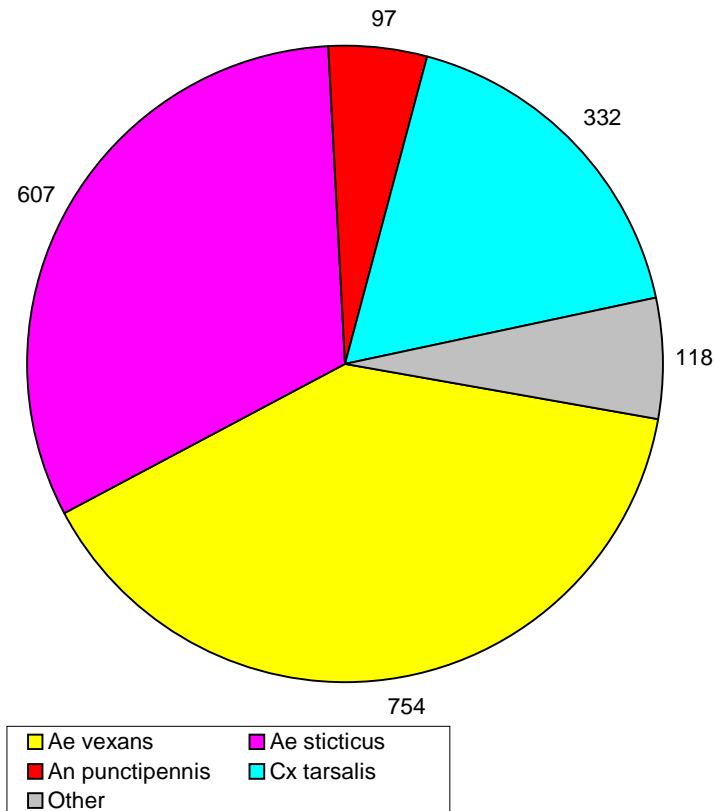
EVS Trap totals for the Ridfield Wildlife Refuge and Surrounding Areas



Vancouver Trapping Results

In the 1999 season fewer mosquitoes were sampled per trap than last season, 146.5 and 218 respectively. This season the number of *Aedes sticticus* sampled dropped by almost 50%, while the numbers of *Ae vexans* trapped increased by over a third. I am not sure how to account for this, this season 13 traps were set, of those seven were set near Vancouver lake. Last seasons trapping regime was similar, 12 traps were set and seven of those were in the Vancouver Lake area. The numbers of *Anopheles punctipennis* and *Culex tarsalis* trapped this season were still significant, 97 and 332 respectively, and on par with last season. Both of these mosquitoes are of medical importance and they were trapped primarily in areas with heavy recreational use, for example Vancouver Lake Park, Frenchman's Bar, and the Salmon Creek Greenway.

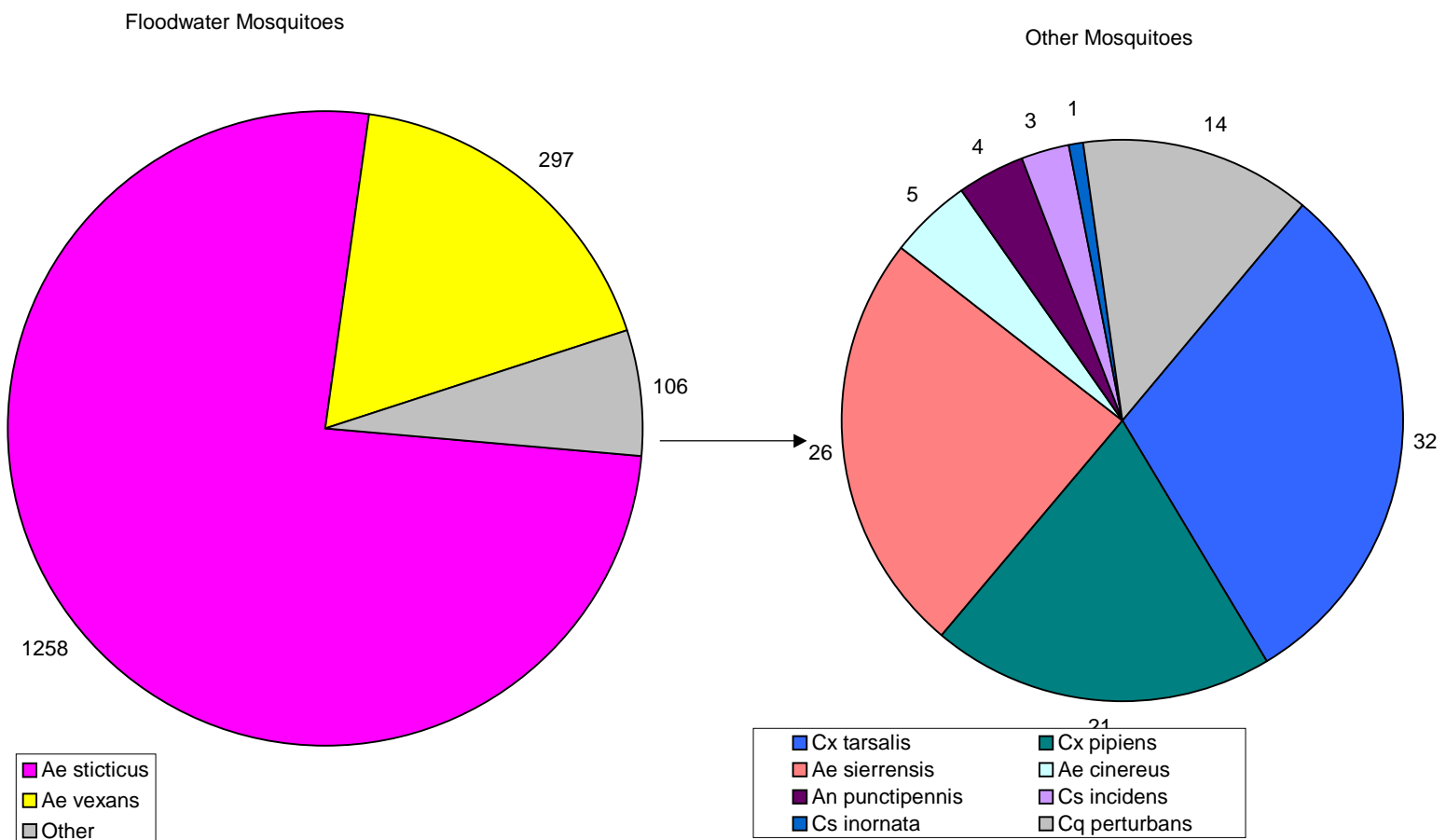
EVS Trap Totals for Vancouver



Camas-Washougal Trapping Results

This season there was a 70% increase in the numbers of mosquitoes trapped in the Camas-Washougal area. As with the rest of the county *Aedes sticticus* was the dominant species (84%) followed by *Ae vexans* (9%). Of the *Ae vexans* trapped, 80% were from a single trap set just over the levee from the 37th street. The other species trapped were centered on individual homes.

EVS Totals for the Camus - Washougal Area



Encephalitis Virus Surveillance

Encephalitis is a viral disease that infects people causing swelling of the brain or spinal cord tissue. There are several different viruses that can cause the disease. On the West Coast the two most prevalent encephalitides are Western Equine Encephalomyelitis (WEE) and St. Louis Encephalitis (SLE). Both of these viruses are vectored by the mosquito species *Cx tarsalis*.

Cases of mosquito-borne encephalitis have occurred throughout California, in Southern Oregon, Eastern Washington, and Western Canada. Early symptoms of encephalitis resemble other diseases and there is a possibility of misdiagnosis. There is currently one known case of mosquito-transmitted encephalitis in Oregon and there could be more in both states. With proper monitoring, an epidemic could be averted.

Encephalitis surveillance has not been conducted in Oregon or Washington in at least the last ten years. Thus, it was decided to initiate a surveillance program in Clark, Multnomah and Cowlitz counties. Processing mosquitoes for encephalitis testing involves sorting gravid *Cx tarsalis* into pools of no more than 50 individuals. This year the weather was not conducive to production of vector species later in the season. Due to time constraints and uncontrollable circumstance no pools were sent for testing. I would recommend continued surveillance to ensure that we are aware of viral activity before an epidemic occurs.

Summary

Evaluation of the data gathered from the surveillance program suggests that, in the areas monitored, the floodwater is producing culicine and anopheline mosquitoes throughout the summer. Research shows that grassy margins of semi-permanent bodies of water are capable of producing large populations of culicine mosquitoes. The production of anopheline mosquitoes is generally restricted to the shallow open water of small lakes and ponds. Areas known to produce large numbers of culicine mosquitoes include sewage treatment ponds and storm water retention facilities. In particular *Cx tarsalis* is generally found at the grassy margins of lakes and ponds.

The most common mosquito throughout the county was this season was *Ae sticticus*, a very aggressive and strong flying mosquito. Second most common was *Ae vexans*, another aggressive biter. Both of these mosquitoes are known to fly 20 miles in search of blood meals and are thought to return to the same oviposition site year after year. Three medically important mosquitoes trapped in Clark County this season were *Cx tarsalis*, *Cx pipiens*, and *An freeborni*. Both *Culex* species are vectors of the encephalitis viruses and the *Anopheles* is a vector of malaria. These species should always be maintained at levels that minimize the risk of mosquito-borne disease epidemics.